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| 10/541,390 | 07/01/2005 | Joseph Gan | 62897B | 1202 |
| 109 7590 03/12/2009 The Dow Chemical Company Intellectual Property Section P.O. Box 1967 Midland, MI 48641-1967 | | | | |
| EXAMINER FEELY, MICHAEL J | | | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/541,390

Applicant(s)

GAN ET AL.

Examiner

Michael J. Feely

Art Unit

1796

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 December 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 7, 11-15 and 19-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 7 and 19-21 is/are rejected.
- 7) ☒ Claim(s) 4, 11-15 and 20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/808)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Pending Claims

Claims 1-4, 7, 11-15, and 19-21 are pending.

Response to Amendment

1. The objection to the disclosure has been overcome by amendment.
2. The objection to claim 5 has been overcome by amendment.
3. The rejection of claims 6 and 8-10 under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Higaki (JP 2000-309699) has been rendered moot by the cancellation of these claims.
4. The rejection of claims 1-4, 7, and 19 under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Higaki (JP 2000-309699) has been overcome by amendment.
5. The rejection of claims 5, 6, 8-10, and 16-18 under 35 U.S.C. 102(a) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Yang et al. (WO 02/100947 A1) has been rendered moot by the cancellation of these claims.
6. The rejection of claims 1-4, 7, 11-15, 19, and 20 under 35 U.S.C. 102(a) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Yang et al. (WO 02/100947 A1) has been overcome by amendment.
7. The rejection of claims 5, 6, 8-10, and 16-18 under 35 U.S.C. 103(a) as being unpatentable over Matsumoto et al. (WO 02/12393 A1) in view of Asano et al. (US Pat. No. 5,641,839) has been rendered moot by the cancellation of these claims.

8. The rejection of claims 1-4, 7, 11-15, 19, and 20 under 35 U.S.C. 103(a) as being unpatentable over Matsumoto et al. (WO 02/12393 A1) in view of Asano et al. (US Pat. No. 5,641,839) has been overcome by amendment.

Response to Arguments

9. Applicant's arguments with respect to the pending claims have been considered but are moot in view of the new ground(s) of rejection (see below).

Claim Objections

10. Claim 20 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 20 is dependent from now *cancelled* claim 18.

Claim Rejections - 35 USC § 103

11. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

12. Claims 1-3, 7, 19, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiobara et al. (US Pat. No. 5,643,975).

Regarding claims 1-3, 19, and 20, Shiobara et al. disclose: (1) a halogen-free polymer composition (Abstract: *composition does not require halogen materials*) comprising:

A) a thermoplastic polymer or polymer blend (column 3, line 44 through column 8, line 15), and

B) a modified multi-functional epoxy resin which is the reaction product of a multi-functional epoxy resin selected from the resins represented by the following structures (*see claim for structures*) (column 9, lines 6-21; column 2, line 36 through column 3, line 23 – *note: brominated material not required*) with an epoxy modifier which will react with epoxy functionalities (column 9, lines 6-21; column 3, lines 24-43), which modifier is: selected from the group consisting of phenolic compounds, polyisocyanates, acidic compounds, acid anhydrides, compounds containing an amino group, butadienes, and combinations of one or more of these modifiers (column 3, lines 24-32); and

C) a phosphorus containing compound (column 8, line 66 through column 9, line 5);

(2) wherein A) is selected from the group consisting of: polymers produced from a vinyl aromatic monomer or hydrogenated versions thereof, polycarbonate, acrylonitrile butadiene-styrene copolymer/polycarbonate compositions, hydroxy phenoxy ether polymers, polyphenylene ether polymers, polyethylene terephthalate, epoxy resins, ethylene vinyl alcohol copolymers, ethylene acrylic acid copolymers, polyolefin carbon monoxide interpolymers, polyolefins, cyclic olefin copolymers, olefin copolymers and homopolymers, polyphenylene oxide and any combination thereof (column 3, line 63 through column 4, line 32); (3) wherein A) is selected from the group consisting of: styrene-butadiene block copolymers, polystyrene, high impact polystyrene, acrylonitrile-butadiene-styrene copolymers, and styrene-acrylonitrile copolymers (column 3, line 63 through column 4, line 32);

(19 & 20) an article produced from the halogen-free ignition resistant polymer composition of Claim 1 (column 9, lines 13-21);

Shiobara et al. fail to explicitly disclose: (1) wherein the reaction product contains from 0 to less than 10 wt. percent residual epoxy groups, based on the total weight of the epoxy resin.

Rather, they disclose that their epoxy resin is reacted with their phenolic curing agent in relative amounts such that the equivalent ratio of the epoxy groups to the hydroxyl groups ranges from 0.5 to 2, and preferably 0.7 to 1.5 (*see column 3, lines 33-36*). This range obviously embraces an excess of phenolic curing agent which would have fully, or near-fully, consumed all of the epoxy groups present. In light of this, it appears that an obvious excess of phenolic curing agent would have inherently yielded a reaction product containing from 0 to less than 10 wt. percent residual epoxy groups, based on the total weight of the epoxy resin.

Therefore, the instantly claimed modified multi-functional epoxy resin component would have been obviously satisfied by the cured material of Shiobara et al. because they obviously embrace an equivalent excess of phenolic curing agent, with respect to epoxy resin. This obvious excess would have fully, or near-fully, consumed all of the epoxy groups present, yielding a reaction product containing from 0 to less than 10 wt. percent residual epoxy groups.

Shiobara et al. also fail to explicitly disclose: (1) an *ignition resistant* polymer composition. However, it appears that this would have been inherently or obviously satisfied because Shiobara et al. obviously satisfy all of the material/chemical limitations of the instant invention. In light of this, it has been found that, "Products of identical chemical composition can not have mutually exclusive properties." A chemical composition and its properties are inseparable. Therefore, if the prior art teaches the identical chemical structure, the properties

applicant discloses and/or claims are necessarily present – *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

Regarding claim 7, Shiobara et al. fail to explicitly disclose: (7) wherein the modified multi-functional epoxy resin is functionally modified with more than one modifier.

Shiobara et al. present multiple species of phenolic curing agent (*see column 3, lines 24-32*), wherein they are presented as functional equivalents. In light of this, it has been found that combining equivalents known for the same purpose is *prima facie* obvious - *see MPEP 2144.06*. Such a combination of equivalents would have obviously satisfied the limitations of the instant invention.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the epoxy resin of Shiobara et al. with more than one modifier because: (1) they present multiple species of phenolic curing agent, wherein they are presented as functional equivalents; and (2) it has been found that combining equivalents known for the same purpose is *prima facie* obvious.

13. Claims 1-3, 7, and 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishikawa et al. (US Pat. No. 4,529,755).

Regarding claims 1-3 and 19-21, Nishikawa et al. disclose: (1) a halogen-free polymer composition (Abstract: *composition does not require halogen materials*) comprising:

A) a thermoplastic polymer or polymer blend (column 2, line 53 through column 4, line 9), and

B) a modified multi-functional epoxy resin which is the reaction product of a multi-functional epoxy resin selected from the resins represented by the following structures (*see claim for structures*) (column 5, line 47 through column 6, line 60; column 2, lines 38-52: *see novolak-type*) with an epoxy modifier which will react with epoxy functionalities (column 5, line 47 through column 6, line 60; column 4, lines 10-53), which modifier is: selected from the group consisting of phenolic compounds, polyisocyanates, acidic compounds, acid anhydrides, compounds containing an amino group, butadienes, and combinations of one or more of these modifiers (column 4, lines 10-25), and

C) a phosphorus containing compound (column 5, lines 6-34, particularly lines 20-24);

(2) wherein A) is selected from the group consisting of: polymers produced from a vinyl aromatic monomer or hydrogenated versions thereof, polycarbonate, acrylonitrile butadiene-styrene copolymer/polycarbonate compositions, hydroxy phenoxy ether polymers, polyphenylene ether polymers, polyethylene terephthalate, epoxy resins, ethylene vinyl alcohol copolymers, ethylene acrylic acid copolymers, polyolefin carbon monoxide interpolymers, polyolefins, cyclic olefin copolymers, olefin copolymers and homopolymers, polyphenylene oxide and any combination thereof (column 2, line 53 through column 4, line 9); (3) wherein A) is selected from the group consisting of: styrene-butadiene block copolymers, polystyrene, high impact polystyrene, acrylonitrile-butadiene-styrene copolymers, and styrene-acrylonitrile copolymers (column 2, line 53 through column 4, line 9);

(19 & 20) an article produced from the halogen-free ignition resistant polymer composition of Claim 1 (column 5, line 47 through column 6, line 60);

(21) wherein the epoxy modifier is selected from the group consisting of 2-phenylphenol, 4-phenylphenol, dimethyl phenol, tertial buthylphenol, bisphenol-a, bisphenol-f, methylene diphenyl diisocyanate, a toluenediisocyanate; salicylic acid, sulphanilamide, succinic acid anhydride, and dodecenylsuccinic anhydride (column 4, lines 10-25).

Nishikawa et al. fail to explicitly disclose: (1) wherein the reaction product contains from 0 to less than 10 wt. percent residual epoxy groups, based on the total weight of the epoxy resin.

Rather, they disclose that their epoxy resin is reacted with their hardener in relative amounts such that the equivalent ratio of the epoxy groups to the active hardening groups ranges from 0.5 to 1.5, and preferably 0.8 to 1.2 (*see column 4, lines 34-53*). This range obviously embraces an excess of hardener which would have fully, or near-fully, consumed all of the epoxy groups present. In light of this, it appears that an obvious excess of hardener would have inherently yielded a reaction product containing from 0 to less than 10 wt. percent residual epoxy groups, based on the total weight of the epoxy resin.

Therefore, the instantly claimed modified multi-functional epoxy resin component would have been obviously satisfied by the cured material of Nishikawa et al. because they obviously embrace an equivalent excess of hardener, with respect to epoxy resin. This obvious excess would have fully, or near-fully, consumed all of the epoxy groups present, yielding a reaction product containing from 0 to less than 10 wt. percent residual epoxy groups.

Nishikawa et al. also fail to explicitly disclose: (1) an *ignition resistant* polymer composition. However, it appears that this would have been inherently or obviously satisfied because Nishikawa et al. obviously satisfy all of the material/chemical limitations of the instant invention. In light of this, it has been found that, "Products of identical chemical composition

can not have mutually exclusive properties.” A chemical composition and its properties are inseparable. Therefore, if the prior art teaches the identical chemical structure, the properties applicant discloses and/or claims are necessarily present – *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

Regarding claim 7, Nishikawa et al. fail to explicitly disclose: (7) wherein the modified multi-functional epoxy resin is functionally modified with more than one modifier.

Nishikawa et al. present multiple species of hardener (*see column 4, lines 10-24*) wherein they are presented as functional equivalents. In light of this, it has been found that combining equivalents known for the same purpose is *prima facie* obvious - *see MPEP 2144.06*. Such a combination of equivalents would have obviously satisfied the limitations of the instant invention.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the epoxy resin of Nishikawa et al. with more than one modifier because: (1) they present multiple species of hardener, wherein they are presented as functional equivalents; and (2) it has been found that combining equivalents known for the same purpose is *prima facie* obvious.

Allowable Subject Matter

14. Claims 4 and 11-15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

15. The following is a statement of reasons for the indication of allowable subject matter: the prior art fails to reasonably teach or suggest the instantly claimed invention with the weight proportions set forth in claims 4 and 11 (claims 12-15 are dependent from claim 11).

Conclusion

16. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Communication

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J. Feely whose telephone number is (571)272-1086. The examiner can normally be reached on M-F 8:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Y. Pyon can be reached on 571-272-1498. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael J Feely/
Primary Examiner, Art Unit 1796

March 11, 2009